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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/847,091	05/01/2001	Eric Arthur Swanson	SYCS-042 (P96)	5732

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LAHIVE & COCKFIELD, LLP.
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BOSTON, MA 02109

EXAMINER

CHAN, ALEX H

ART UNIT	PAPER NUMBER
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2633

DATE MAILED: 01/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/847,091

Applicant(s)

SWANSON, ERIC ARTHUR

Examiner

Alex H Chan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 May 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 May 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other:

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the bandpass filters in claim 4, channel add devices in claim 5, channel drop devices in claim 6, demultiplexers in claim 7, multiplexers in claim 8, interleavers in claim 9, attenuators in claim 10, and dispersion compensation modules in claim 11 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. **Claims 17-23** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, applicant fails to show, in both drawings and written specification, how adding (claim 17) and dropping (claim 18) channel, demultiplexing sub-band (claim 19), multiplexing sub-band (claim 20), interleaving sub-band (claim 21), attenuating sub-band (claim 22), and compensating for dispersion of sub-band (claim 23) are being done.

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Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. **Claims 1-3, 7-8, 11-15, 19-20 and 23-28** are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,549,315 B1 to Kakui.

Regarding claims 1-3, 7-8, Kakui discloses an optical sub-assembly for processing an optical signal (Fig. 2), the sub-assembly comprising: a working (e.g. working path in that C-band continues to be transmitted to 12 even if path of L-band fails as known in the art) path (path in which C1 travels through) of the optical network; a first sub-band (C-band) of the optical signal carried only by the working path; a protect (e.g. protect path in that L-band continues to be transmitted to 12 even if path of C-band fails as known in the art) path (path in which L1 travels through) of the optical network; a second sub-band (L-band) of the optical signal carried only by the protect path; a first module (e.g. amplifiers, 200) disposed along the working path for affecting the working path (Col. 5, lines 64-67); and a second module (300) disposed along the protect path for affecting the protect path (Col. 5, line 67-Col. 6, line 3).

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Regarding claim 11, Kakui discloses the first (via 211, 212 and 240 of Fig. 2) and second (via 311, 312 and 340 of Fig. 2) modules are comprised of dispersion compensation modules.

Regarding claims 12-15 and 19-20, Kakui discloses the steps of: separating the optical signal into a first sub-band and a second sub-band (via 100 of Fig. 2 and Col. 12, lines 33-39); routing the first sub-band through a first module and routing the second sub-band through a second module of the same type as the first module (Col. 5, lines 27-63); and recombining (via 400 of Fig. 2 and Col. 12, lines 46-50) the first and second sub-bands (Col. 6, lines 3-10).

Regarding claim 23, Kakui discloses compensating for dispersion (via 211, 212 and 240 of Fig. 2) of the first sub-band with the first module and compensating for dispersion (via 311, 312 and 340 of Fig. 2) of the second sub-band with the second module.

Regarding claims 24, Kakui discloses an optical amplifier node ($1_1, 1_2, 1_3 \dots 1_N$ of Fig. 1) for amplifying an optical signal, the amplifier node comprising: a first amplifier (200 of Fig. 2) for amplifying only signals from a first sub-band (C-band) of the optical signal (Col. 5, lines 64-67), wherein the signals are carried only by a working path; and a second amplifier (300 of Fig.

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2) for amplifying only signals from a second sub-band (L-band) of the optical signal (Col. 5, line 67-Col. 6, line 3), wherein the signals are carried only by a protect path.

Regarding claims 25-26, Kakui discloses a sub-band splitter (100 of Fig. 2) for splitting the optical signal ("A" and 11 of Fig. 2) into at least two sub-bands (C-band and L-band).

Regarding claims 27-28, Kakui discloses a sub-band combiner (400 of Fig. 2) for combining at least two sub-bands into the optical signal ("B" and 12 of Fig. 2).

6. **Claims 12 and 24** are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,356,384 B1 to Islam.

Regarding claim 12, Islam discloses the steps of: separating (via 14 of Fig. 1A or 36 and 38 of Fig. 3A) the optical signal (12 of Fig. 1A) into a first sub-band (e.g. "C" of Fig. 2B or BAND #1 of Fig. 3A) and a second sub-band ("L" of Fig. 2B or BAND #2 of Fig. 3A); routing the first sub-band through a first module (18 of Fig. 1A or 3A) and routing the second sub-band through a second module (16 of Fig. 1A or 3A) of the same type as the first module (e.g. both are amplifiers); and recombining (via 20 of Fig. 1A or 3A) the first and second sub-bands (Col. 4, lines 40-62).

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Regarding claims 24, Islam discloses an optical amplifier node (Fig. 3A) for amplifying an optical signal, the amplifier node comprising: a first amplifier (18) for amplifying only signals from a first sub-band (BAND #1) of the optical signal, wherein the signals are carried only by a working path (e.g. path of 36 only carries BAND #1); and a second amplifier (16) for amplifying only signals from a second sub-band (BAND #2) of the optical signal, wherein the signals are carried only by a protect path (e.g. path of 38 only carries BAND #2).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. **Claims 1-2, 7-8, 12-14 and 19-20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Jiang in view of U.S. Patent no. 6,480,328 B2 to Shimojoh.

Regarding claims 1-2 and 12-14, Jiang discloses a method of processing an optical signal in an optical network (Fig. 2), comprising the steps of: routing the first sub-band (via "WORK" path for λ_1 , λ_2 , λ_3 of Fig. 3 or C-band carried only by working path, Col. 8, lines 45-48) through a first module (300 for affecting working path, Col. 5, lines 49-51) and routing the second sub-band (via "PROTECT" path for λ_a , λ_b , λ_c of Fig. 3 or L-band carried only by protect path, Col. 8, lines 48-51) through a second module (300' for affecting protect path, Col. 5, line

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67-Col. 6) of the same type as the first module. Jiang does not explicitly disclose the steps of separating the optical signal into a first sub-band and a second sub-band and recombining the first and second sub-bands. Shimojoh discloses the steps of separating the optical signal (via 30A of Fig. 3 or DEMULTIPLEXER of Fig. 49) into a first sub-band ("C") and a second sub-band ("L") and recombining the first and second sub-bands (via 30B of Fig. 3 or MULTIPLEXER of Fig. 49). One of the ordinary would have been motivated to employ the above steps so that the individual bands can be amplified for suppressing noise figure which deteriorated by insertion loss component (Col. 1, line 66-Col. 2, line 15). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the optical communication system of Jiang by incorporating the above steps because this can help improve the noise figure as suggested by Shimojoh.

Regarding claims 19-20, Jiang in view of Shimojoh discloses demultiplexing (via 300 or 300' of Fig. 2, Jiang or 30B of Fig. 3, Shimojoh) and multiplexing (via 300 or 300' of Fig. 2, Jiang or 30A of Fig. 3, Shimojoh) the first sub-band with the first module and the second sub-band with the second module.

Regarding claims 7-8, the limitations introduced by claims 7-8 correspond to the limitations introduced by claims 19-20, respectively. The treatment of claims 19-20 reads on the corresponding limitations of claims 7-8.

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9. **Claims 3-6, 9-11, 15-18 and 21-28** are rejected under 35 U.S.C. 103(a) as being unpatentable over Jiang in view Shimojoh as discussed above, and further in view of U.S. Patent No. 6,388,805 B1 to Spock et al (hereinafter Spock).

Regarding claims 15 and 24, Shimojoh discloses amplifying the first sub-band with the first module (via 11 of Fig. 3), but does not explicitly discloses amplifying the second sub-band with the second module. Spock discloses amplifying (i.e. amplifying only signals in fiber (path) 72 of Fig.5) the first sub-band (e.g. C-band) with the first module (via 68 of Fig. 5) and amplifying (i.e. amplifying only signals in fiber (path) 42 of Fig. 5) the second sub-band (e.g. L-band) with the second module (via 44 of Fig. 5) (Col. 1, line 63-Col. 2, line 3 and Col. 5, lines 46-67). Accordingly, one of the ordinary skill in the art would have been motivated to amplify the first and second sub-bands with first and second module respectively to amplify optical signals on each path (Col. 1, lines 26-27) as suggested by Spock. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the optical communication system of Jiang in view of Shimojoh because optical amplifiers are a mature technology and widely available which are used for amplifying signals.

Regarding claims 16-18, 21-23, Spock discloses all limitations as discussed above, and further discloses filtering (e.g. via L/C filters, abstract), adding at least one channel and dropping at least one channel (e.g. via channel add/drop, abstract and Col. 10, lines 58-60), interleaving (Col. 7, lines 16-28), attenuating (via variable optical attenuators, abstract and Col. 7, lines 27-28) and compensating for dispersion (via dispersion compensation modules, abstract and Col. 7,

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lines 43-45) of the first sub-band with the first module and filtering the second sub-band with the second module.

Regarding claims 25-26, Spock discloses all limitations as disclosed above, and further discloses a sub-band splitter (70 of Fig. 5).

Regarding claims 27-28, Spock discloses all limitations as disclosed above, and further discloses a sub-band combiner (76 of Fig. 5).

Regarding claims 3-6 and 9-11, the limitations introduced by claims 3-6 and 9-11 correspond to the limitations introduced by claims 15-18 and 21-23, respectively. The treatment of claims 15-18 and 21-23 reads on the corresponding limitations of claims 3-6 and 9-11.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kinoshita et al is cited to show L-band, and C-band amplifiers for amplifying L-band and C-band respectively (Fig. 13). Hatami-Hanza et al (Fig. 1), Shiota (Fig. 1), Willner (Fig. 1), Wysocki (Fig. 17) and Roberts et al (Fig. 4, "Red" and "Blue") are cited to show configuration

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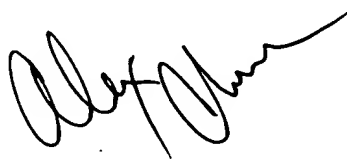
comprising L/C splitters, L/C combiners and L/C amplifying modules. Milton et al is cited to show a demultiplexer and a multiplexer for adding, dropping, and splitting band wavelengths (Fig. 3). Judy is cited to show a WDM coupler for splitting different band of wavelengths and recombining for transmission (Fig. 13).

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alex H Chan whose telephone number is (703) 305-0340. The examiner can normally be reached on Monday to Friday (8am to 6pm EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (703) 305-4729. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Alex Chan
Patent Examiner, AU 2633
January 5th, 2004



JASON CHAN
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